National Cohort Study of Preoperative Bacteriuria, Surgical Prophylaxis, and Postoperative Outcomes

1124. Acute Kidney Injury Associated with Combination Antimicrobial Therapy in the Medical Information Mart for Intensive Care (MIMIC) III Database

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Session: 142. Clinical: Soup to Nuts

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Background. Increased acute kidney injury (AKI) incidence is linked with coadministration of vancomycin (VAN) and piperacillin-tazobactam (TZP) in the general hospital population when compared with VAN and cefepime (FEP); however, this phenomenon was not found in critically ill patients.

Methods. Patients receiving VAN in combination with FEP or TZP for at least 48 hours during an intensive care unit stay were included in this retrospective review. AKI was defined with the Risk, Injury, Failure, Loss, and End-stage (RIFLE) criteria. Exposure to common nephrotoxins was captured within 24 hours of combination therapy initiation through the entire treatment window. Basic descriptive statistics were performed, along with bivariable and multivariable logistic regression models of AKI odds.

Results. In total, 2230 patients were included, with 773 receiving FEP+VAN and 1457 receiving TZP+VAN. The groups were well balanced at baseline in most covariates, with the exception of hepatorenal syndrome diagnosis (TZP+VAN 1.4% vs. FEP+VAN 0.3%, $P = 0.02$) and vasopressor exposure (TZP+VAN 26.2% vs 21.5%, P = 0.01) being more common in the TZP+VAN group. Patients in the FEP+VAN group had a higher underlying severity of disease (Charlson comorbidity index [CCI] 2.7 vs. 2.3, P =0.0002). AKI incidence was higher in the TZP+VAN cohort (35.1% vs. 26.5%, $P = 0.00004$), with each stratification of the RIFLE criteria being higher. The time until onset of AKI was similar between groups (TZP+VAN median 1 [0–3] days vs. FEP+VAN 1 [0–4] days, P =0.2). After multivariable logistic regression, TZP+VAN therapy was associated with an adjust odds ratio (aOR) of AKI of 1.54 (95% confidence interval [CI] 1.25–1.89) compared with FEP+VAN. Other variables associated with increased odds of AKI included: age >= 65, duration of antibiotic therapy, higher baseline renal function, sepsis, endocarditis, hepatorenal syndrome, thiazide diuretic exposure, and increased CCI.

Conclusion. Treatment with TZP+VAN is associated with significant increases in AKI incidence among critically ill patients, independent of other risks for AKI.

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1125. Impact of Vancomycin-Associated Acute Kidney Injury on Patient Outcomes in MRSA Bacteremia

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Background. Acute kidney injury (AKI) is a well-known adverse effect of vancomycin. Varying degrees and causes of AKI have demonstrated different effects on patient outcomes. Since AKI with vancomycin is typically reversible, we investigated how AKI associated with vancomycin therapy impacts patient mortality and time to discharge.

Methods. Unique patients with methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia and who received at least one dose of vancomycin were identified in a national Veterans Affairs cohort from January 1, 2002 to October 14, 2015. Patients with a history of dialysis in the previous year and those with AKI on admission were excluded. AKI was defined according to RIFLE criteria, as an increase in serum creatinine (SCr) of 0.5 mg/dL or 1.5× from the admission SCr, on a day they received vancomycin. Patient characteristics including demographics and comorbidities defined by ICD9 codes were compared between groups. Effect estimates for inpatient mortality were determined with a backward stepwise logistic regression model in SAS 9.2. For patients without inpatient mortality, time to discharge was analyzed using Wilcoxon rank-sum test.

Results. There were 7691 included patients with MRSA bacteremia, and 23.8% ($n = 1830$) developed AKI during therapy. Mean age was 66.7 (±12) years and 97.8% ($n = 7525$) were male. Patients with AKI were more likely to have congestive heart failure, diabetes, chronic kidney disease, and to be admitted to the intensive care unit (all $P < 0.001$). Overall inpatient mortality was 17.7% ($n = 1361$). The crude odds of inpatient mortality were 67% higher in patients with AKI. In the adjusted model, AKI was an independent predictor of mortality (OR 1.19, 95% CI 1.02–1.40, $P < 0.03$). Median (IQR) time to discharge was 11 (6–19) days without AKI and 18 (11–31) days with AKI ($P < 0.0001$).

Conclusion. Vancomycin-associated AKI is associated with increased inpatient mortality and longer time to discharge. Further research is needed to compare clinical outcomes for other groups of patients, and to determine the impact of monitoring interventions to improve safety and decrease AKI.

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1126. National Cohort Study of Preoperative Bacteriuria, Surgical Prophylaxis, and Postoperative Outcomes

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Session: 143. Clinical: UTI

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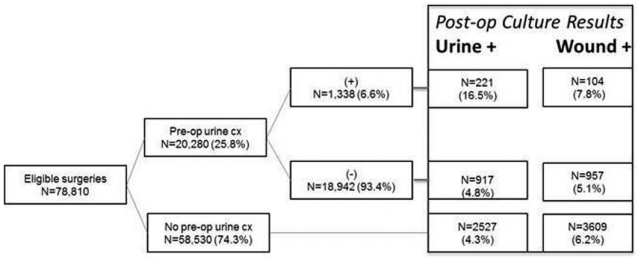
Background. Despite recommendations against screening urine for bacteriuria prior to non-urological surgery, it is still a common practice. If the urine culture (Ucx) is positive, clinicians often feel compelled to give targeted therapy or expand the peri-operative prophylaxis (PPX) regimen to cover the urinary organism. Large multicenter studies are lacking. We aimed to evaluate rates and results of preoperative urine screening and postoperative outcomes among a national cohort of surgical patients.

Methods. All patients who underwent cardiac, orthopedic implant, or vascular surgery within the national VA health care system during the period from 10/1/08–9/30/13 and had the PPX regimen manually validated were included. Rates of positive Ucx and wound cultures during the 90-day post-operative period were compared between patients with and without pre-operative bacteriuria. Among patients with a positive pre-op urine culture the association between activity of surgical PPX and positive post-op cultures was evaluated.

Results. $N = 78,810$ surgeries were evaluated (21,889 cardiac, 46,565 orthopedic implant, 10,356 vascular). A pre-op Ucx was performed in 26% (Fig); of these, 6.6% were positive and 852 (63%) received PPX active against the uropathogen. Positive pre-op Ucx was associated with higher rates of positive post-op Ucx and wound cultures (Fig). Among patients who received active PPX, post-op Ucx was positive in 46% compared with 39% who received inactive PPX. The rate of post-op wound cultures was not different between patients who received active (25%) vs. inactive (24%) PPX. The pre-op and post-op organisms were the same in 117/221 (52.9%) Ucx and 17/104 (16.3%) wound cultures, respectively. PPX activity did not affect the match rate.



Conclusion. This is the largest, multicenter study demonstrating no difference in post-op urine and wound cultures in patients receiving active vs. inactive surgical PPX for pre-op bacteriuria. Prevalence of bacteriuria was similar to other surgical populations. Limitations include predominantly male population and need for further characterization of pre-op antibiotic therapy and UTI and SSI outcomes.

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1127. The Utility of Repeat Blood Cultures for Bacteremic Urinary Tract Infections and Associated Durations of Therapy

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Background. Urinary tract infections (UTIs) are common among hospitalized patients with 10–40% of cases complicated by bacteremia. Recent literature suggests limited utility in repeating blood cultures for non-*Staphylococcus aureus* bacteremia; however, clinicians often repeat blood cultures to document clearance prior to selecting definitive therapy for bacteremias. Additionally, comparative data evaluating treatment duration for bacteremic UTIs are lacking and clinical practice guidelines do not address optimal duration for bacteremic UTIs. We aimed to evaluate local practice patterns and utility of repeat blood cultures and their influence on treatment durations for bacteremic UTIs.

Methods. We identified patients with bacteremia from a urinary source at the Salt Lake City Veterans Affairs (VA) hospital from a previously compiled cohort of inpatients with bacteremia from any source between November 2013 and October 2015.